SUMMARY

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Ed Margolin said the primary themes the conference has come down to are uncertainty and change. I think that is very aptly put. I hope the uncertainty about the major policy questions and the future can be resolved in the next few years and that the changes can be made acceptable.

I'm with the Congressional Research Service (CRS) and I think it's appropriate to say a word or two about CRS as there are often many people who don't know. It's a branch of the Library of Congress that provides Congress with the information and analytical support that it requests in order to make more enlightened public policy and public law. We answer any questions Congress cares to pose. Our products range from a one-word telephone response to multi-volume, multi-year studies. Some CRS analysts work almost as adjunct staff, briefing members and even going to the floor of the Senate.

We get a lot of interesting questions. The Congressional Research Service, a couple of years ago, was asked to answer one of the weightier questions of all time. It was from a Congressman -- I don't think it was one from Pennsylvania. The question was: what did come first, the chicken or the egg? For those of you who are interested, it was the egg.

My job is to summarize and to try to draw the substance from the two days we have spent. Rather than actually summarizing and trying to recapitulate and rehash what we've all heard, I will try to compare and evaluate and try to draw some common themes from it. The danger in simply summarizing is that something important might be left out.

It reminds me of the story about a very straight-laced minister who had one glaring fault: he always read his sermons word-for-word. He wrote them out in laborious longhand and read them page-for-page in a sort of high sing-song voice that used to drive his congregation up the wall. One of the members of the congregation, after interminable Sundays of this, decided to take matters into his own hands. Just before the service, he saw the sermon on top of the altar, and stole one of the pages in the middle of the sermon. Later, the minister was reading the sermon in his usual fashion. He was talking about the creation of Adam and Eve in the Garden of Eden:

"Well Adam was certain to have been delighted and pleased at his new companion Eve, created from his rib, and standing there before him that morning in the Garden of Eden in all her glory," he read. "Eve for her part must have been equally excited. Adam said to Eve, "the Lord has worked a great wonder in creating you to be my woman'. Eve then said to Adam ".. and the minister turned the page ..." ....hmm, excuse me there seems to be a leaf missing".

Rather than have any leaves missing I'm going to focus on the themes at our conference and not try to rehash what the speakers have presented. Looking over the program, one can see it was a very well crafted program. I don't say that having been one of the people who crafted it because we all rode on the coattails of Ed Margolin. Ed is the guru of this policy area. He was lucky to have two very capable expeditors at TRB: Floyd Thiel and Ed Ward.

I think the program essentially revealed the nexus between two public policy areas. These are areas where we're really very much in a dilemma, facing in each of them a great deal of uncertainty and a great deal of change. These are the basic area of energy policy and the area of transportation policy.

There is a great overlap between energy policy and transportation policy that has really gone much too little observed. Very little study has been focused on it. There are two links. One is the energy used by transportation. The other is the transportation used by energy. At first blush everyone is aware of the energy used by transportation because it's obvious to you every time you go by a gas pump. It's a major factor of everyone's daily life.

The flip side of this connection between these major public policy issue areas is less well recognized. The transportation used by energy is so obvious. In fact, when you think about it, energy is probably transportation's major customer or major commodity. Essentially all pipeline transportation is directed to carrying energy, and all electric transmission. The majority of the traffic on the waterways is dedicated to carrying energy. I think Al Johnson said 60 percent was coal and petroleum in one form or another. The major commodity carried on the railroad system is an energy commodity. While trucks are perhaps the least dependent of the modes on carrying energy, still without those that do the whole system would shut down. On truck movement of energy depends the final distribution of all petroleum products. Trucks provide major assistance in the coal cycle and nuclear cycle as well as even some natural gas carriage. So the transportation of energy is as strong a factor in the overlap between the two issue areas as is the energy required by transportation.

We have considered these two major themes at this Conference. Congressman Schuster provided the overall perspective on it from a transportation point of view. What does a person who has studied transportation say about energy? Then Mario Cardullo followed up a little later: What does a person who has been involved in energy say about transportation? We then looked at it from a modal point of view, and I think we learned from several excellent speakers that each of the modes has its role, has its problems, and has its promise. We learned that there is major room for new study and investigation, as Bruce Allen spelled out later. Then the program shifted again to the future fuels for transportation, because transportation is a liquid-fuel consumer, by and large. We looked at oil from shale, from synfuels, gasahol, and learned that these fuels are going to have to be brought on to make the future transportation demands that are considered to be necessary possible to meet.

I thought that one of the things that I might contribute would be an attempt to define the energy problem. I've been involved in looking at the transportation of energy commodities but almost nothing else in the transportation field. I have, however, been studying energy for about 10 years at this point. I think it helps to try to get an idea of what the problem is.

The problem is that there isn't a problem. The problem is that there are four problems with a "twist". I'll tell you what the four problems are, and then I'll tell you what the "twist" is.

The first problem is coping with the economic role of energy in the United States. This problem is that energy is a vital ingredient to the economy and having cheap energy has been a major reason the economy has reached the height that it has. The threat that that energy will no longer be cheap is a threat to the economy.

The second problem is the obvious one of dependence on foreign sources and vulnerability for our

sources of energy. Half of our oil comes from countries over which we have very little leverage and they have enormous leverage over us. They're beginning to exercise it and it's beginning to hurt very badly. We're scrambling for ways out of it and we don't see too many. So we have this great political vulnerability and that's a different problem from the one seen from a strict economic perspective.

A third one is the problem of the depletion of oil and gas. The most heavily used and easily developed of our energy resources. We all know that we're "over the hump" on both of those fuels for domestic production. I think it was two weeks ago that an oil company representative said in testimony that he didn't think there was a price for domestic crude oil that would lead us to produce more than we had historically, that we had simply reached the point of declining production and it was going to continue that way. So we have that problem to adjust to and, again, a different problem than either the economic or vulnerability problems.

The fourth energy problem is the problem of social costs, the environmental cost of production and use, the safety aspects, the impacts on society as a whole and on individual lifestyles. A lot of people see the energy crisis as a threat of greater pollution, greater danger and disease, and change of lifestyle for the worse.

These are the four problems: the economics, import vulnerability, the oil and gas depletion, and the social costs. Now I mentioned that there's a "twist". Well the "twist" is that whatever you do to solve any one of those problems will make the others worse. That is really the nub of our energy crisis.

Let me give you some examples. If you work to keep energy cheap for the sake of the economy, then where do you get the energy from? Well since our domestic sources are nore expensive you increase imports. Since you're keeping it cheap you create heavy demand and you increase the rate of depletion. What are you doing to the environment? Well, you make it easier to continue the waste and make it sooner that we'll have to go to dirtier and more damaging kinds of fuels. You're precluding the payment of the full cost of using and finding energy that tends to damage the environment.

Now let's consider what happens if you focus on the second problem, import dependence. By limiting import dependence you increase the depletion of domestic resources. Limiting import dependence by reducing imports forces you to require the use of domestic resources whatever their environmental impacts. You make yourself bite the bullet of having the impacts here rather than overseas where the energy is being produced that you could be bringing in. Import vulnerability may improve, but economics, depletion, and environmental costs get worse.

Oil and gas depletion is the third problem. Obviously, if you hold down oil and gas depletion to try to avoid the "drain-America-first syndroms", you have to import more, increasing dependence. The price of domestic energy goes up and hurts the economy. The alternative fuels to oil and gas which you are saving are likely to be more damaging to the environment.

Finally, if you focus on having no impacts on the environment and on minimizing the social costs and disruption of the enfrastructure of society, then you have to assign those costs some place and they go on higher costs for energy, on more imports and on more rapid depletion of the sources we're using now where the incremental environmental problem isn't too great.

While that may be a complicated definition of the energy problem, I think that if you look at it from the four perspectives in that way, you will find each of them a valid definition of a national policy problem. You will also find that actions designed to cure each of them makes the other problems worse. Then you will also begin to understand why,for example,the Congress has not identified any one of them and said "this is the problem, not the others."

When I looked at the transportation situation, from my own limited understanding of it, and wondered whether it would fit sort of the same kind of definition. I think there are some similarities that it would be worthwhile to evaluate. The economic role of transportation is very simple. This country has depended on inexpensive transportation; it's a very critical input to all economic services and processes. The policy of the government, as in energy, for decades has been to support inexpensive transportation, subsidize it and promote it, and to make sure that it was there to allow the development of our economy. Every bit as much as the inexpensive energy that we've been able to enjoy, the excellent and inexpensive transportation system we've been able to enjoy has brought us to where we are.

I think, second, that there's a dependence side of transportation as well. It's not dependence on overseas nations and political vulnerability. I think there's a modal dependence that has been built up over the years and is a logical consequence of the inexpensiveness of transportation, in the same way that oil import dependence is derived from inexpensive foreign oil. For moving people, we are dependent on the automobile. Since transportation by automobile has been so inexpensive, perhaps dependence on the automobile is more than it would have been without the subsidies and the public expenditures that have been made supporting the automobile. It's clear that there's a modal dependence on the railroads for coal movement at this point and I think it may have been that government policies preserved that more than might have been the case otherwise in a purely free market. I think there's a modal dependence on pipelines for oil and gas. Who knows what alternatives there might have been, but there have been policies in both regulation and in land use that have made it very easy to use oil and gas pipelines.

The depletion problem in energy may be analagous to the deterioration of key transportation systems, and the greater costs of constructing and maintaining waterways, railroad rights-of-way, highways and pipelines. As in energy, what was inexpensive in transportation is no longer inexpensive, even while our need for current systems in good repair is compounded by our need for new systems.

I do not claim that this analysis can be followed to the logical extreme without inconsistencies, or that energy and transportation are twin policy areas. That would obviously be too glib. I am merely suggesting that there are intriguing parallels, and that actions in both policy areas are complicated by having unhelpful consequences. Finally, I think the social costs aspect of the transportation situation are also analagous. There is a preference perhaps to using existing modes rather than constructing new modes. There is opposition to new systems from people who have not had a major facility running through their own areas. The environ-

mental aspects of transportation investments are focussed on.

Since the four energy problems have analogs in the transportation policy area, you might ask about the "twist": whether in fact actions taken to solve the transportation dilemma looked at in one way might not worsen the others. If you address the first problem, you make the attempt to keep transportation inexpensive. You can only do this by restricting a carrier's ability to charge a full market price for the service, a price that accounts for all the costs involved. You continue subsidies, and thus you perpetuate the modal dependencies. You keep people in their cars. You don't build the mass transit because that is expensive. Systems cannot generate the revenue to renew themselves, increasing the deteriotation. Also, you eventually worsen your social cost situation because change is coming however you try to disguise it economically.

If you attempt to reduce the dependence on given modes, attacking the second problem, you find it is very expensive and quickly affects the role of cheap transportation in the economy. We're talking about billions of dollars of investment in new modal capacity and new transportation. That cost has to be borne and it's going to have to be borne by the user of transportation. It's going to have a very strong impact on the economic role that transportation has played to this point in this country. In the same way that the energy crisis that we are facing will have a very major impact on economic activities that we undertake and on our lifestyles, so will the resolution of transportation problems.

The analogy continues to work: working on upgrading and replacing transportation capability conflicts with the desire to keep transportation cheap because it is so costly; it perpetuates existing modal dependencies, and puts off the day of reckoning when no amount of repair and maintenance of all systems will satisfy the needs that have been incurred.

Finally, focusing on mitigating the environ mental costs and wrenching change of new systems will lead us to make them more expensive even as we continue dependence on older systems and require more investment to keep them operating.

What we need to do now is to begin examining the similarities that have been brought out in the conference, so that we can stop thinking about energy and transportation as separate areas and start thinking about them as major policy areas with a very significant overlap. We can perhaps deal with our problems constructively when considering a given approach if we consider both the energy consequences and the transportation consequences. It may shape our decisions. It may shape our approaches and it may mean that we avoid worsening a transportation dilemma by improving an energy one or vice versa.

What are some of the themes we have all talked about and listened to that I think are susceptible to that kind of approach? Certainly the economic one is one. The only thing certain about the future of energy and transportation is that they will both be greatly changed in economics. They'll both be a lot more expensive, and I certainly think that the transportation of fuels may lead the way. If we just absolutely refuse to let the prices of fuel and transportation change by means of restrictive regulation, refuse to allow the full cost to be paid, or assign the cost to other things, we build a distortion into the market for energy and for transportation that only worsens our situation. Such a distortion creates its own constituencies like the individual we heard about in the little town in Pennsylvania who kept the train running by himself by protesting every suggested service drop. That's the kind of thing I'm talking about. That kind of distortion and that kind of constituency can be built up if you attempt to suppress the natural free market meshing of the supply and demand for both of the commodities and the price that results.

However, adjusting to the higher prices is a very painful process for an economy with the inertia that we have. Remember that we've built a huge societal machine that used oil and the oil we built that machine to use cost us only about $2 a barrel. We're now facing $20 a barrel oil and synfuels and the rest. The painful thing to remember is that, expensive as it is, OPEC oil is the cheapest energy around that we can use for what we need energy for. Otherwise, we'd be using something else, wouldn't we? We have to have that OPEC oil or we have to make a decision that we're going to pay more for the energy we will have than we're paying for OPEC oil. Synfuels, gasahol, oil shale -- they are all more expensive than OPEC oil. By making a decision to get away from import dependence on OPEC we're simultaneously making a decision that we're going to pay more for our energy than the rest of the world.

The other thing is that if we succeed and actually do create enough synfuels and gasahol to limit our own OPEC imports and to substantially reduce them, what do we do? We effectively put a ceiling on OPEC oil that the rest of the world will benefit from as much as we do. We'll pay the cost of the synfuels establishment, the cost of the gasahol plants and we'll have all that investment and we'll reduce our imports, and those who still buy OPEC will benefit from our investment.

The capital requirements are obviously very major in both cases. The overall approach to money markets that is going to be necessary in the next few years to obtain the $4.2 Trillion we heard yesterday we will need for transportation is going to be something to see. There's just about that much in the money market. We must remember that a lot of that transportation investment for which you need the $4.2 Trillion is only required if you have the whatever trillion that you need for the energy aspects of your investment, too. Those are not the only economic and national purposes which are going to be very expensive to implement.

I think another interesting thing to note is that those transportation modes for energy which are the most economical for energy movement and often which are the least environmentally damaging are also most capital intensive. They are the least flexible. They can't be rerouted. You don't dig up a pipeline and bury it some place else. The value of a pipeline which is no longer carrying oil and gas is just about zero. It costs you about as much to dig it up as the steel is worth. So there's very little salvage value.

I think a second major area of combined evaluation and a theme that we've all talked about here is the area of government regulation. Regulations are used for a number of purposes. I think perhaps the major one in these two areas has been as a moderator of change to preserve the status quo and to keep fluctuations from landing hard on the backs of people economically. This is a valid role but, again, you run the risk of building in the distortions that we've talked about. When you know that the price of energy and the price of transportation is inexorably going up, to try to preserve the status quo is not doing yourself any service in the long run. Our economy can adjust at a certain rate and to allow those prices to moderate at the maximum so that that adjustment can happen without real trauma is probably the better policy.

Finally, there is the regional and geographic

aspect of both energy and transportation. And again there's a great similarlity. When we're looking at the future for energy supplies we're looking at the tapering off of a major supply area of the traditional Oklahoma - Texas oil and gas producing areas. The Appalachian coal resource area is a major area historically and can become more productive but the new areas for energy are primarily the West and Alaska. There is a great requirement for investment in those areas and in transportation from those areas to make that energy available to us. Those sources do not plug very neatly into our existing transportation capacity. There are very few pipelines from the West. The bulk of our rail transportation capacity is not there. In Alaska as well we're having a great deal of difficulty making the connection. So that while we try to have our overall energy consumption grow and our economic process go on smoothly without great lurches and drops we have to do it by adding areas that are not tied in to our current system and probably by letting capacity in our current system be less than fully utilized. That's a great challenge.

Then, of course, there are the regional aspects. People in the West have a right, a valid reason to be disturbed about what the future of that region is going to be. As you recall, the standard synfuel planning plant is a 50,000 barrel a day plant. When you talk about 2.5 million barrels a day of synfuel, you're talking about 50 of those plants. These are industrial installations of a size that can match any industrial installation you can think of, and they're going to be out there where the coal is to a large extent, and they're going to have enormous impacts on the environment and on the lifestyle of the people who are there. I think it is wrong for people in the West to picture themselves as being "colonized" by the rest of the nation. In fact the lifestyle they enjoy would not be possible without the industrial infrastructure in the East, not to mention the Federal support of water programs and reclamation programs they have had access to over the years. Most Western regional disputes on energy and transportaioon are among Westerners, not between the West and the East. The Federal government has made great investments in the West as well as extracting significant tolls.

So these are a few of the themes that I think can be used to analyze both policy areas where they interface. I think it is incumbent on all of us to try to consider the energy impacts of a transportation problem. How will this impact on our energy supply and situation? Vice versa, energy planners should not proceed willy-nilly on a development of a new fuel or on a major effort to get people to conserve fuel without looking at the transportation effects. Those who advocate energy or transportation options without weighing the impacts on the local governments and the economics of the citizens as well as the institutions involved are going to find that in their solutions to problems they've created bigger problems than they've solved.

In closing, I'd personally like to thank everybody who spoke at this conference because I really thought it was one of the better conferences I ever attended. I would also like to thank you all for the liberty of letting me speak my own mind rather than merely summarizing everything everybody else has already said.